

1.0 OPERATION MANUAL SPECIFICATIONS

1.1 Scope

The Main Contractor shall provide an Operation Manual covering the work of the Civil Contract and all Nominated Sub-contracts. Operation Manual shall also be provided by the various equipment suppliers and Nominated Sub-Contractors for integration into the Main Contractor's manual.

1.2 General

The Operation Manual shall be an essential part of the equipment supplied under this Contract. The supply and delivery of equipment will be regarded as incomplete until the draft Operation Manual is submitted and approved. Draft Operation Manual with the content specified shall be submitted in the format specified by Goulburn Valley Water (GVW). GVW has developed Operation Manual templates for use by the Main Contractor, Nominated Subcontractors and equipment suppliers.

1.2.1 Definitions:

The term contractor shall be read as meaning the Main Contractor, unless specifically noted otherwise throughout this section of the Specification.

1.2.2 Submission of Draft Copy of Manuals

1.2.2.1 Within 21 days prior to the commencement of commissioning of the Works the Contractor shall provide to the Superintendent for approval, one (1) digital copy of the draft Operation Manual for all items, or groups of similar items of equipment supplied under the Contract.

1.2.2.2 The Contractor shall also amend existing Operation Manual instructions where the Contract works impact on existing plant operations.

1.2.2.3 The manual shall be specific to equipment being supplied. Supplier equipment manuals, Catalogues, sales brochures and other documents giving general information will not be acceptable alone as Operation Manual.

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- 1.2.2.4 The Operation Manual shall be formulated according to the requirements of GVW's Operation Manual Writing Guide. The scope of the process element operation instructions to be created or amended by the Contractor shall be agreed to by the Superintendent prior to preparation of the process element operation instructions.

1.2.3 Submission of Digital Version Manuals

- 1.2.3.1 Prior to the commencement of commissioning of Works, the Contractor shall provide to the Superintendent a compact disc containing the digital Operation Manual for approval. This shall include all electrical, mechanical and instrumentation equipment provided by it or its sub-contractors.
- 1.2.3.2 The digital Operation Manual shall be formulated according to the requirements of GVW's Operation Manual Writing Guide.

1.2.4 Final Submissions

When the draft manual has been accepted by the Superintendent, the Main Contractor shall submit to the Superintendent, within one (1) calendar month of receipt of the Superintendent's acceptance of the draft, one (1) fully indexed Hard Copy of the Operation Manual and one (1) complete Digital version of the Operation Manual. The Digital version should include associated supplier equipment manuals, drawings and any additional attachments which may compose of more than one (1) Compact Disc.

1.3 Format

1.3.1 General

The Digital and Hard Copy Operation Manual for process element operating instructions shall be formulated to the above mentioned Writing Guide requirements using GVW's Operation Manual Writing Guide and the supplied Microsoft Word templates:

- a) Contractor Template for Operation Manual
- b) Contractor Template for Maintenance Requirements

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1.3.2 Format of Hard Copy Manuals

- 1.3.2.1 Text shall be submitted on A4 sheets, with a minimum weight of 90 GSM. Drawing sizes are to be confined to maximum of A3 size (90 GSM) and folded to A4 size in such a way that their title block is visible. Prints of drawings shall be made using a black and white printing process, and shall be sufficiently clear to allow reproduction without loss of legibility by a digital scanning system.
- 1.3.2.2 The Operation Manual is to be supplied in a white 4 ring A4 binder.

1.3.3 Format of Digital Manuals

- 1.3.3.1 The Contractor shall provide the following information:
- c) The process element operation instructions shall be prepared using the Microsoft Word Contractor Template for Operation Manual provided by GVW.
 - d) 'As constructed' drawings should be supplied in AutoCAD 2014 drawing format using the GVW supplied template; and Adobe PDF version 8.0 or latest version. Final supplied Drawings in AutoCAD are to be complete individual stand-alone drawings without references to other drawing files or attachments unless these attachments are also supplied (i.e. combine all files to create one detailed drawing the same as the produced paper copy. The AutoCAD files are to be provided in 3D format, where 3D will assist in conveying clarity to complex diagrams. These AutoCAD files should be created by using the etransmit function to include all relevant embedded files such as pen settings, shape files, etc. XREF files (external reference files) should be bound into the drawings as part of the etransmit function. Shapes should be converted into blocks where possible or the relevant shape file included.
 - e) An indexed list of supplied drawings identifying the drawing number, drawing name and electronic file name in Microsoft Word format. This list is to be incorporated into the Operation Manual.
 - f) Individual equipment information in Adobe PDF format (version 8.0 or later). Submitted PDF files should be specific for a single piece of equipment; and do not include multiple equipment details in a single file.
 - g) An indexed list of supplied equipment information identifying the equipment name and electronic in Microsoft Word format.

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1.4 Content

1.4.1 General

Operational descriptions are to be captured in the blank Microsoft Word Contractor Template for Operation Manual as provided by GVW.

Instructions have been included on the template in red font. Instructions in red font shall be deleted as the template is populated. Three different process element sections have been supplied and these sections may be duplicated if more process element information is to be included.

The completed template can then be printed and used as the Contractor's Hard Copy Manual for the Process Element description. All other mentioned requirements listed in the Specification that are to be produced and supplied for the digital manuals, are to use the relevant applications from the Microsoft Suite of Office Products.

1.4.1.1 The manual shall be sufficiently comprehensive for routine maintenance, overhaul and repairs to be carried out by personnel who are qualified to undertake maintenance work but who are not necessarily familiar with the equipment. The manual shall contain the following information:

- a) A comprehensive list of contents including:
 - (i) Equipment Name (and number if applicable).
 - (ii) Equipment Type and Model Number.
 - (iii) Equipment Capacity description.
 - (iv) Manufacturer's Name.
 - (v) Equipment Supplier's Name, Address and Telephone Number.
 - (vi) Service Representative's Name, Address and Telephone Number.
- b) Data sheets for each equipment item (including individual components) shall provide:
 - (i) Title (i.e. "Data Sheet").
 - (ii) Equipment Name (and number if applicable).
 - (iii) Equipment Type, Model Number, Serial Number.
 - (iv) Specific Design Characteristics.
 - (v) Performance Characteristics (including any relevant curves).
 - (vi) Lubrication Type including: specification, brand and quality etc.

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- (vii) List of individual items of equipment which are components of, or are associated with, the equipment described in this sub-clause of the Specification.
- (viii) Reference Drawing List.
- (ix) All other information necessary to fully specify the item of equipment.
- (x) Equipment supplier's name, address and telephone number.
- c) Operating instructions and description of the equipment and its principles of operation including:
 - (i) Theory of Operation.
 - (ii) Function of Equipment.
 - (iii) Pre-Start-Up Checks and Adjustments.
 - (iv) Start-Up Procedures.
 - (v) Normal Operating Modes (i.e. Pump Selector Switch to AUTO), including references to the SCADA screen images provided by GWV.
 - (vi) Normal Shut-Down Procedures.
 - (vii) Process Controls.
 - (viii) Emergency Start-Up and Shut-Down Procedures.
 - (ix) Visual checks and observations that should be made routinely to ensure equipment is operating satisfactorily.
 - (x) Diagnostic troubleshooting techniques, where applicable, to determine probable causes of operating difficulties or alarm situations.
- d) Maintenance instructions in tables provided in template showing:
 - (i) Recommended preventative maintenance procedures, tests and activities to ensure that equipment and components are adequately maintained.
 - (ii) Frequency that each preventative maintenance procedure should be carried out.
 - (iii) Lubrication points and recommended lubricants.
 - (iv) Details of any special tools, lubricants or cleaning agents necessary to implement the preventative maintenance procedures.
- e) Dismantling instructions:

Dismantling instructions shall include step-by-step procedures to extract, fully dismantle, re-assemble and re-install the equipment. The instructions shall include checks, tests, tolerances on fitting and lining up components of the equipment and all procedures to re-install the equipment correctly. The instructions shall be supplemented by exploded view, drawings or photographs.

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- f) Spare parts lists with cross reference to sectional drawing shall include:
 - (i) Part Name.
 - (ii) Part Number (identification for ordering of spares).
 - (iii) Number of parts required.
 - (iv) Material of Construction.
 - (v) Availability.
 - (vi) Supplier.
- g) Illustrations and drawings and shall NOT be limited to the drawings required to be submitted under other clauses of the Specification and shall include:
 - (i) General arrangements.
 - (ii) Sectional arrangements in sufficient detail to allow all components to be identified, all tolerances, clearances and fits necessary for the equipment, dismantling, and re-assembly of equipment components shall be shown.
 - (iii) Any other drawings necessary for complete understanding of installation, operating and maintenance of the particular item of equipment, including 3D format.
 - (iv) Subdivision drawings
- h) Function, application, specification, and comprehensive technical data of all equipment including sub-assemblies, proprietary items, and system circuit and schematic diagrams thereof where applicable.
- i) Troubleshooting.
- j) Lists of spare parts recommended to be held in stock.
- k) Procedure of ordering spare parts.
- 1.4.1.2 The manual shall contain clear and comprehensive illustrations and/or drawings with all parts readily identifiable.
- 1.4.1.3 The Contractor may provide this information for review and comment by the Superintendent prior to the final submission.
- 1.4.1.4 After the completion of Commissioning, the Contractor shall supply one (1) fully indexed Hard Copy of the Operation Manual and one (1) digital copy on compact disk to the Superintendent, including any amendments to the information previously supplied which may have become necessary in light of the commissioning process.
- 1.4.1.5 The Contractor shall not be entitled to a Certificate of Practical Completion until all required Process Elements of the Operation Manual have been submitted to, and accepted by, the Superintendent.

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